TECHNICAL REVIEW AND EVALUATION OF APPLICATION FOR AIR QUALITY CONTROL PERMIT FOR EXISTING SOURCE

PERMITTEE: El Paso Natural Gas Co. DATE: August 7, 1997

ADDRESS: P.O. Box 1492 PERMIT NO.: 1000168

El Paso, TX 79978 NEW SOURCE: N

EQUIPMENT LOCATION: Eight miles E. on Country Club Rd from Exit 343 off I-10 RENEWAL: Y

Willcox, Cochise County, AZ 85643 TITLE V SOURCE: Y

PERMIT CLASS: I PORTABLE: N

PERMIT ENGINEER: Sandy Farace

APPLICABLE REGULATION	CONDITION	MEETS CONDITION YES	NO	N/A	SEE RMK NO.	RVWD BY
R18-2-326	A. ADMINISTRATION 1. Have all applicable fees been paid?			X	1	SF1
Appendix 1 R18-2-304.E	2. Has a complete application been submitted? (attach completeness checklist)	X				SF1
R18-2-304.G	3. Has additional information necessary to address any requirements which became effective after the application was filed been submitted? (if applicable)			X		SF1
R18-2-307.A	4. Has a copy of the complete application been submitted to the EPA for review (only required if the application is for a Class I permit)?	X				SF1
R18-2-305	6. Confidentiality a. If portions of the application were submitted with a notice of confidentiality, has the applicant been notified as to the Director's confidentiality determination?			X		SF1
	b. If portions of the application have been determined by the Director to be confidential, has a notice of confidentiality been included in the file?			X		SF1
R18-2-101.60 and 61	7. Is the source classified as a major source as per R18-2-101.61 or a major modification as per R18-2-101.60?	X				SF1
R18-2-306.8.e	8. Has all information and records requested by the Director or the Hearing Board been submitted?	X				SF1
R18-2-310, 309, and 327	9. Have all emission inventory questionnaires, excess emission reports, and compliance certifications been submitted?	X				SF1
ARS § 49-402	10. Does the Arizona Department of Environmental Quality have jurisdiction over this source?	X			2	SF1

APPLICABLE REGULATION	CONDITION	MEETS CONDITION YES	NO	N/A	SEE RMK NO.	RVWD BY
Articles 7, 9 and 11	B. AIR POLLUTION CONTROL EQUIPMENT 1. Have the parameters of all process equipment which may cause or contribute to air pollution been identified?	X				SF1
	2. Have all air releases containing regulated air pollutants (including any hazardous air pollutants) been identified and characterized as to strength, concentration, and type of pollutant?	X				SF1
Articles 7, 9 and 11	3. Has the applicant demonstrated that each emission unit is so designed, controlled, or equipped with such air pollution control equipment that it may be expected to operate without emitting or causing to be emitted air contaminants in violation of A.A.C. Title 18, Chapter 2, Articles 7, 9, and 11? (Attach calculations.)			X	3	SF1
Article 6	4. Has the applicant demonstrated that each non-point emission unit is so designed, controlled or equipped with such air pollution control equipment that it may expect to comply with requirements of Article 6 emissions from existing and new non-point sources?	X			4	SF1
A.R.S. §49-427.C	5. Has the source been constructed according to the prior permit? (if not, the source must first obtain a permit revision before receiving a permit renewal)	X			5	SF1
Articles 7, 9 and 11	6. Has the source demonstrated that proposed positive control techniques can be maintained at full operational capacity? (Attach calculations.)	X			3	SF1
Articles 6, 7 & 9	C. REGULATORY SUMMARY 1. Has the applicant supplied sufficient material to demonstrate that emission standards can be met for the following:					
	a. Visible emissions	X				SF1
	b. Particulate emissions	X				SF1
	c. Sulfur dioxide emissions	X				SF1
	d. Total sulfur emissions			X		SF1
	e. Volatile organic compounds	X				SF1
	f. NO_X emissions	X				SF1
	g. Other pollutants _____	X				SF1
Article 11	2. Has the applicant demonstrated the emissions from the facility are such that they will meet hazardous air pollutant standards?			X		SF1

APPLICABLE REGULATION	CONDITION	MEETS CONDITION			SEE RMK NO.	RVWD BY
		YES	NO	N/A		
R18-2-312	3. Have any performance tests required by the prior permit been conducted?	X			6	SF1
R18-2-312	4. Has a visible emission test been performed? (if applicable)			X		SF1
R18-2-306	5. Does the permit contain all requirements which became applicable to the source after the prior permit was issued?	X				SF1
R18-2-309.2	6. Does the permit contain a requirement for the submittal of compliance certifications (at least annually)?	X				SF1
R18-2-309.5	7. Does the permit contain a compliance plan which outlines the procedures used to comply with all requirements and specifies the means for demonstrating compliance?	X				SF1
R18-2-309	8. Does the permit contain a compliance schedule to be used to achieve compliance with those items with which the source does not currently comply.			X	7	SF1
R18-2-306.3, 4	9. Does the permit contain sufficient monitoring, reporting and recordkeeping requirements to determine whether or not the source is in compliance at any time?	X				SF1

PERMITTEE: El Paso Natural Gas Company - Bowie Station DATE: 05/02/94

TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT NO. 1000168

REMARKS

REMARK NUMBER	REMARKS	REVIEWED BY
1.	This application is submitted for renewal of existing operating permit #031218P0-98 for El Paso's Bowie Compressor Station.	SF1
2.	The facility is located near Willcox, Cochise County. ADEQ has jurisdiction over this source.	SF1
3.	El Paso operates one turbine for natural gas transmission. No control equipments are used to control emissions from burning natural gas.	SF1
4.	El Paso will control emissions of non-point sources by maintaining gravel, adding fresh vegetation and using dust suppressants and wetting agents.	SF1
5.	The GE turbine was installed in 1971.	SF1
6.	Performance tests are required to be conducted annually for all major sources. Since the Bowie station did not operate at full capacity or was not fully operational since the time of installation, no testing has been conducted to-date.	SF1
7.	El Paso has to-date no records of any violations.	SF1
	ADDITIONAL REMARKS	
8.	The current operating permit (#031218PO-98) stipulates that Bowie may uprate the existing GE turbine from 9800 hp to 10736 hp. Bowie has not yet made this uprate, so only the existing source performance standards of A.A.C. Title 18, Chapter 2 apply. If the turbine is uprated during the course of the permit, EPNG may then be subject to 40 CFR 60 Subparts A and GG, if the uprate incurs any capital expenditure.	SF1
9.	Compliance status: According to Field Activity Report (FAR) #11511 dated September 21, 1994, El Paso's Bowie Compressor Station is in compliance. Note: The FAR states that the turbine has a rating of 10,400 hp. According to Jerry Comaduran of EPNG, the turbine has not been uprated and remains at 9800 hp.	SF1
10.	There is no permit condition to require sulfur monitoring and reporting included in the Title V permit because EPNG combusts only pipeline quality natural gas. In addition, their sulfur content is limited by the FERC Tariff agreement. Therefore, EPNG should not exceed the standards outlined in A.A.C R18-2-719.	SF1

REMARK NUMBER	REMARKS	REVIEWED BY
11.	EPNG has proposed the following exemptions: *(1) Lubricating oils - EPNG stores oils in lubricating tanks at the Bowie facility that are less than 10,000 gallons and have a vapor pressure less than the fuel oils exempted in R18-2-701.21. EPNG proposes that ADEQ exempt the oil storage tanks from R18-2-710, or list this requirement as inapplicable.* ADEQ agrees that monitoring, reporting and recordkeeping requirements are not applicable to Bowie's oil tanks and has listed this activity as insignificant. *(2) Sulfur monitoring - EPNG's GE Turbine burns only pipeline quality natural gas that contains less than 0.8% by weight sulfur, as required by its FERC Tariff. EPNG requests to exempt sulfur recording and reporting required in R18-2-719.I and J.* ADEQ has determined that this is acceptable.	SF1

TECHNICAL REVIEW OF PERMIT NUMBER 1000168
(El Paso Natural Gas Company, Bowie Compressor Station)

General Comments

El Paso Natural Gas Company (EPNG) provides natural gas transportation services for natural gas suppliers and end users throughout the southwestern United States. EPNG owns and operates a large pipeline network for which the Bowie Compressor Station serves as one of the gas compression locations. Compression is needed to maintain enough pressure in the pipeline to keep the gas flowing.

The Bowie station operates one regenerative cycle gas turbine to drive the compression unit, and one electric generator attached to the gas turbine. Both are powered by the combustion of natural gas. The gas turbine stack is the primary sources of air pollutant emissions. The primary pollutant present in the stack gases resulting from combustion of natural gas is NOx. Formaldehyde, SO_2, CO, and VOCs are other trace pollutants present in the stack gases. Other equipment on site is comprised mainly of valves, compressor seals, connections and associated piping, and emissions from these units are mainly trace amounts of VOCs.

Regulatory History

Though the Bowie station has been operating for a few decades, the first and only air quality permit was issued to them on 11/3/1993. The permit number is M031218P0-98. The most relevant conditions of this permit are:

1. Permittee shall uprate the existing GE turbine from 9800 hp to 10736 hp.
2. Permittee shall limit SO_2 to 0.015% by volume @15% O_2.
3. Permittee shall conduct a performance test on the turbine stack within 180 days of permit issuance. The performance tests shall quantify emission rates of NOx and CO.
4. Visible emissions shall have opacity lesser than 40%.

As of the date of writing this document, EPNG has not yet made the uprate to the turbine. If the uprate can be accomplished without a capital expenditure, according to 40 CFR 60.14(e)(2), that by itself shall not be considered a modification. In that case the Bowie station would remain subject to R18-2-719. However, if the uprate incurs a capital expenditure, the turbine would then be subject to 40 CFR 60 Subpart A and GG. Therefore, in the permit, a separate section for emission limits, monitoring/recordkeeping and testing was added for the turbine uprate.

No performance test has been conducted to date because the Bowie station has not operated continuously since the issuance of the permit, and the turbine would have to be fired solely for the purposes of complying with the above referenced permit conditions. Operation of compressor stations is contingent on natural gas demand and supply fluctuations, and Bowie has been operating on stand-by status for the duration of this permit. As of the date of writing this document,

a performance test has yet to be completed on the gas turbine stack. There have been no recorded violations of any permit conditions.

Emissions

The Title V application provides the following potential emission rates:

NOx: 184.29 tpy
CO: 47.22 tpy
VOC: 8.58 tpy
SO_2: 0.20 tpy
Formaldehyde: 3.79 tpy

These emission rates were based on emission factors (e.g. AP-42), theoretical stoichiometric considerations and 8760 hours of operation per year. They have also reported test data based on testing carried out in 1993. The measured hourly emission rates when multiplied with the actual hours of operation in 1993 give the following actual emissions for that year:

NOx: 41.4 tpy (test data, actual hours)
CO: 1.99 tpy (test data, actual hours)
VOC: 0.049 tpy (test data, actual hours)
SO_2: 0.05 tpy (emission factors, actual hours)
Formaldehyde: 0.96 tpy (emission factors, actual hours)

The emissions inventory (EI) for the year 1995, submitted to the Arizona Department of Environmental Quality (ADEQ) reported the following emissions:

CO: 0.01 tpy
NOx: 0.52 tpy
SO_2: 0 tpy
VOC: 0 tpy

Permit Contents : Attachment B

The gas turbine was manufactured in 1970 and is not subject to the provisions of any of the new source performance standards (NSPS). The state rule that covers gas turbine engine operations is *R18-2-719 : Standards of performance for existing stationary rotating machinery*. Please note that the auxiliary engine is also considered stationary rotating machinery and is subject to R18-2-719. This state rule considers emissions of three pollutants (i) particulate matter, (ii) visible emissions, and (iii) sulfur dioxide. However, if EPNG uprates the existing turbine with a capital expenditure, the turbine will be subject to A.A.C. R18-2-901.1 and 901.38. (A NSPS for gas turbines was promulgated on 9/10/1979 and is listed as Subpart GG of 40CFR60. This contains NOx and sulfur dioxide standards).

Emission Limits/Standards

A. Regenerative Gas Turbine and Auxiliary Engine

The pollutants that require monitoring under A.A.C. R18-2-719 are PM, SO_2 and Opacity. Other pollutants included in the emission limits table of the permit are NOx, CO, VOCs and HAPs.

PM: Natural gas combustion results in negligible particulate matter emissions. The maximum potential particulate emissions from the gas turbines at the Bowie station were calculated to be 6.36 tpy. The emissions standard in R18-2-719.C.1 imposes a particulate matter emissions limit of 71.71 tpy.

SO_2: The operating permit requires EPNG to combust only natural gas for turbine and auxiliary engine operations. In addition, the sulfur content of the natural gas must be less than 0.8%.

NOx, CO, VOC and HAPS: There are no emission limitations for these pollutants.

Opacity: The visible emissions standard, R18-2-719.E, imposes a 40% opacity limitation.

B. Non-point sources

The standards in Article 6 are applicable requirements for non-point sources. The following sources will be monitored:

1. Driveways, parking areas, vacant lots
2. Unused open areas
3. Open areas (Used, altered, repaired, etc.)
4. Construction of roadways
5. Material transportation
6. Material handling
7. Storage piles
8. Stacking and reclaiming machinery at storage piles

All of these areas must comply with the opacity limitation of 40%. The control measures for these sites include gravel for driveways and native vegetation for unused open areas. Most of the other sources require control measures of dust suppressants and/or wetting agents. Material transportation and storage piles also include covering the material, while stacking and reclaiming includes minimizing fall distance.

EPNG has indicated in the application that rare instances of open burning may occur. The condition in the permit directs EPNG to obtain a permit from ADEQ, or the local officer in charge of issuing burn permits.

C. Other Periodic Activities

Abrasive Blasting

EPNG has indicated in the permit application that there might be a few occasions on which abrasive blasting activities are conducted on-site. R18-2-726 and R18-2-702.B are the applicable requirements. The Title V permit requires EPNG to either wet blast or use effective enclosures to reduce visible emissions to less than 40% opacity.

Spray Painting

EPNG has indicated in the permit application that there might be a few occasions on which spray painting activities are conducted on-site. R18-2-727 and R18-2-702.B are the applicable requirements. Volatile Organic Compounds (VOC's) and Opacity are the regulated pollutants. R18-2-727.A and R18-2-727.B are included in the approved State Implementation Plan (SIP). R18-2-727.C and R18-2-727.D are also a part of the approved SIP. They are present in the definitions section of the SIP as R9-3-101.117. EPA approved SIP provision R9-3-527.C is not present in the amended rule. However, R9-3-527.C is an applicable requirement, and is federally enforceable until the current State SIP is approved by the EPA. The Title V permit requires EPNG to capture at least 96% of the overspray (except for architectural coating or spot painting). Also, EPNG shall not dispose by evaporation more than 1.5 gallons of photochemically reactive solvent in any one day.

Mobile Sources

EPNG has indicated in the permit application that there might be a few occasions on which "mobile source" activities are conducted. The following sources will be monitored:
1. Off road machinery
2. Roadway and site cleaning machinery
3. Roadway and site cleaning

R18-2-801, R18-2-802, and R18-2-804 are the applicable requirements. These areas must comply with the opacity limitation of 40%. Control measures include dust suppressants and/or wetting agents.

D. Turbine uprate to 10736 horsepower, with a capital expenditure

If EPNG uprates the turbine, there will be an increase in emissions. Using AP-42 emission factors, the following table shows the increase for each pollutant:

Pollutant	Before Uprate (9800 hp)	After Uprate (10,736 hp)	Change in Emissions
NOx	152.52 tpy	165.99 tpy	14.47 tpy
CO	36.91 tpy	40.44 tpy	3.53 tpy
TOC	8.24 tpy	9.03 tpy	0.79 tpy
SO2	0.26 tpy	0.28 tpy	0.02 tpy
PM10	7.77 tpy	8.51 tpy	0.74 tpy

These changes in emissions are not considered a modification under New Source Review.

If the turbine uprate occurs with a capital expenditure, the gas turbine would be subject to NSPS requirements. The pollutants that require monitoring are SO_2 and NOx. Other pollutants included in the emission limits table of the permit are CO, VOC, PM and HAPs.

SO_2: The emission limit for SO_2 requires EPNG to burn only pipeline quality natural gas that has a sulfur content of less than 0.8%.

NOx*:* The maximum emission limit for NOx is:

$$STD = 0.0150 \frac{(14.4)}{Y} + F$$

where: Y= heat rate (Please see 60.332(a)(2) for a more
F = NOx emission allowance complete explanation of Y and F)

This is in accordance with 60.332(c), due to the heat input of the turbine falling between 10 and 100 million Btu/hr (9800 hp = 24.9 MMBtu/hr).

CO, VOC, PM and HAPs: There are no emissions limitations for these pollutants.

Monitoring and Recordkeeping Requirements

A. Regenerative Gas Turbine and Auxiliary Engine

PM: As noted in a preceding discussion, natural gas combustion results in minimal particulate matter emissions. It was therefore decided that even though an emissions standard exists for particulate matter, it would be unnecessary and impractical to have a rigorous monitoring schedule for the particulate standard. In addition, "Pipeline-quality" natural gas has to conform to standards approved by the Federal Energy Regulatory Commission (FERC). One of the standards in this agreement specifies that the heating value be greater than or equal to 967 Btu per cubic foot. Therefore, it was decided to require EPNG to record the daily lower heating value of the fuel, or maintain a copy of the FERC approved Tariff agreement, which will show that EPNG is maintaining compliance with the lower heating value requirement.

SO_2: Another one of the FERC standards limits the sulfur content in the gas to less than 5 grains/100 scf (which is equivalent to 0.017 weight percent of sulfur). It was decided to require EPNG to record the daily sulfur content of the fuel, or maintain a copy of the FERC approved Tariff agreement, which will show that EPNG is maintaining compliance with the sulfur content requirement.

NOx, CO, VOC, HAPs: EPNG must keep a record of dates and hours of operation of the turbine.

Opacity: There is no specific monitoring/recordkeeping requirement for this pollutant.

B. Non-point Sources

The specific non-point sources are listed in the above section. Monitoring and recordkeeping requirements for driveways includes maintaining the gravel, and keeping a log of dates new gravel is added. Unused open areas includes a monthly status of the areas and dates fresh vegetation was added. All other non-point sources require a

record of the date and type of activity performed, and the type of controls used. Also, monitoring requirements for the applicable open burning rule may be satisfied by keeping all open burn permits on file.

C. Other Periodic Activities

Abrasive Blasting

Monitoring and recordkeeping requirements for abrasive blasting consist of maintaining a log of the date and type of project, and the control measures used.

Spray Painting

Monitoring and recordkeeping requirements for spray painting consist of maintaining a lot of the date and duration of the project, control measures used, and the MSDS of paints used.

Mobile sources

The specific mobile sources are listed in the above section. Monitoring and recordkeeping requirements for off road machinery and cleaning machinery consist of maintaining records of all vehicular maintenance. Roadway and site cleaning requires maintaining a log of the date and duration of project, and the control measures used.

D. Turbine Uprate to 10736 horsepower, with a capital expenditure

As discussed above, the pollutants that require monitoring are SO_2, NOx, CO, VOC, PM and HAPs.

SO_2: "Pipeline-quality" natural gas has to conform to standards approved by the Federal Energy Regulatory Commission (FERC). One of the FERC standards limits the sulfur content in the gas to less than 5 grains/100 scf (which is equivalent to 0.017 weight percent of sulfur). Another standard specifies that the heating value be greater than or equal to 967 Btu per cubic foot. EPNG runs the gas turbines with fuel drawn from their pipeline, and therefore it was decided that maintaining a copy of the FERC approved Tariff agreement on-site would be an adequate means of complying with the monitoring requirements for the sulfur standards.

NOx: The requirement to monitor the fuel nitrogen content has been waived as per EPA Memorandum *Authority for Approval of Custom Fuel Monitoring Schedules Under NSPS Subpart GG* , August 14, 1987. This memo was made available to our Division by Steve Frey of EPA Region IX. One of the items in the memo states:

> **"Monitoring of fuel nitrogen content shall not be required while natural gas is the only fuel fired in the gas turbine."**

CO, VOC, PM and HAPs: EPNG must keep a record of dates of operation of the turbine.

<u>Reporting Requirements</u>

A. Regenerative Gas Turbine and Auxiliary Engine

PM: Because EPNG may comply with the PM emission limit by maintaining a copy of the FERC-approved Tariff agreement, the reporting requirement is to notify the Department of any change in the Tariff agreement relating to lower heating value of fuel within 30 days.

SO_2: EPNG may comply with the emission limit by monitoring the daily sulfur content or maintaining a copy of the FERC-approved Tariff agreement. Therefore, the reporting requirement is to notify the Department when any daily sulfur content is greater than 0.8%, or of any change in the Tariff agreement relating to sulfur content within 30 days.

NOx, CO, VOCs and HAPs: EPNG must submit semi-annual reports of the dates of operation of the turbine.

Additional reporting requirement: EPNG must notify the Department prior to uprating the turbine from 9800 hp to 10736 hp. They must also submit when the change will occur and whether the change will result in a capital expenditure.

B. Turbine Uprate to 10736 horsepower, with a capital expenditure

SO_2: EPNG may comply with the recordkeeping requirement by monitoring the daily sulfur content or maintaining a copy of the FERC-approved Tariff agreement. Therefore, the reporting requirement is to notify the Department of any change in the Tariff agreement relating to sulfur content within 30 days.
NOx: As discussed above, the monitoring requirement for NOx was waived by the EPA.

CO, VOC, PM and HAPs: EPNG must report semi-annual reports of the dates of operation of the turbine.

Testing Requirements

A. Regenerative Gas Turbine and Auxiliary Engine

A performance test for NOx must be conducted once within the permit term after the turbine has been operated for 15 cumulative days. This testing is required for the purpose of PSD review, and because the source has never been tested.

B. Turbine Uprate to 10736 horsepower, with a capital expenditure

In accordance with 40 CFR 60.8(a), EPNG must do an initial performance test for NOx. Thereafter, annual testing is required.

List of Special Provisions

In their application, EPNG provided a list of special provisions that they wanted to be addressed in the permit. This list is located in Tab 1 of the application. They have been addressed in the following manner:
Maintenance and Inspection (Item 1), Emergency Shut Down Systems (Item 3), Cathodic protection system (Item 4), General Maintenance & Construction Activities (Item 6), Start-up, Shutdown & Maintenance (Item 8), Insignificant Activities (Item 9)

It was decided that each of these items qualified for classification as an insignificant activity, and as such was included in the list in Attachment "E".

Hazardous Air Pollutants (Item 2): Refer to Sections VI and X, Attachment "A".

Abrasive Blasting (Item 5): Abrasive blasting activities have an applicable requirement in the Arizona Administrative Code A.A.C. Also, according to the definition in AAC R18-2-101.54, for an activity to be classified as insignificant, it should not have *any* applicable requirement. All projects have to comply with the general requirements of R18-2-726 and R18-2-702.B. Refer to Attachment B, I.C.1 and II.C.1.

Spray Painting (Item 7): A similar argument as in Item 5 above provides the reason for including R18-2-726 as an applicable requirement. Refer to I.C.2 and II.C.2.

Emissions Trading (Item 10): ADEQ has determined that EPNG should apply for a permit revision (if necessary) in case there are any changes in the permitted equipment.

Location of records (Item 11): Refer Section II.B, Attachment “B”.

Portable Sources (Item 12): Any contractor operating portable sources on site will need to obtain an air permit (if required) to cover the portable source operation.

Air Conditioners (Item 13): Refer to Section XXI, Attachment "A".

Asbestos (Item 14): Refer to Attachment “C”.

Performance Tests (Item 15): Refer to Section VI, Attachment "B".